sierra monitor corporation

INSTRUCTION MANUAL

OXYGEN DEFICIENCY MONITOR
(Model 55)

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1. Introduction

1.1 The SMC Model 55 is a portable oxygen efficiency monitor for personnel in confined work places. It is self-contained, light weight and battery operated. It does not require any adjustments by the user other than routine calibrations. The monitor reads true percent oxygen in the presence of any diluents including humidity and will not be affected appreciably by barometric pressure changes caused by elevation or weather changes.

2. Features

2.1 Features of the Model 55 include:

- Temperature Stable
- Barometric Pressure Insensitive
- Large LCD digital display
- High accuracy over temperature range 0-50^{o}C
- Fast response -90% full scale in 10 seconds
- Visual Alarm – LED provided on top of case
- External Earphone for noisy environments
- Single ON/OFF sliding switch
- Long Battery Life – 200 hours on a 9V battery
- Low Battery indication – visual display
- Small Size – Comfortable for user

3. Mechanical Description

3.1 The Model 55 is housed in a rugged, high impact enclosre. The sliding ON/OFF power switch is located on the left side, the calibration potentiometer is accessible on the right side and the digital display is on the front surface. The top of the monitor contains the sensor opening, jacks for earphone and remote sensor, the alarm LED and audible alarms. See Figure 1.

3.2 Located on the back surface of the monitor are a belt clip and the battery cover.

4. Alarms

4.1 LOW OXYGEN CONDITION: When the percent oxygen falls below 19.5 % (factory set) the digital display will be augmented by an audible alarm when using either internal or external sensor. The red LED will also turn on to provide visual indication. If an earphone is in use the alarm will only sound through the earphone.

4.2 LOW BATTERY VOLTAGE: When the battery voltage falls below 3.6 volts, the warning “BAT” will display in the upper left corner.

4.3 LOW SENSOR OUTPUT: Sensor failure will be indicated by abnormally low, unadjustable, reading on the LCD display.

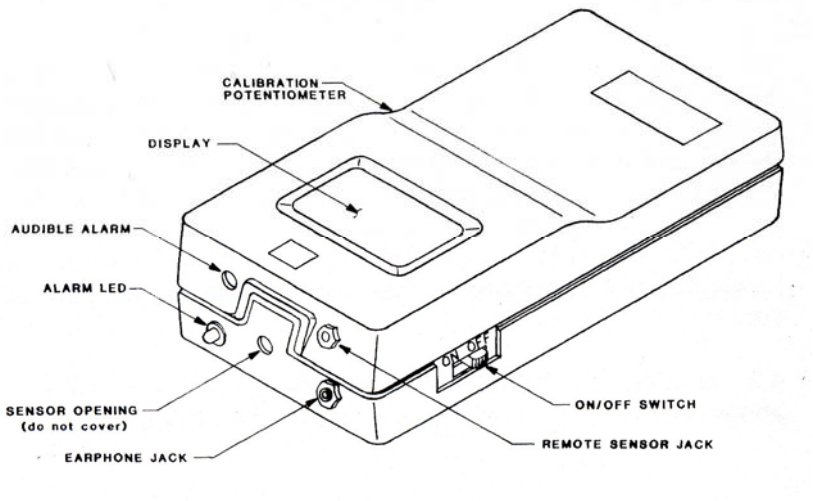
CALIBRATION POTENTIOMETER
DISPLAY
AUDIBLE ALARM
ALARM LED
SENSOR OPENING (do not cover)
EARPHONE JACK
ON/OFF SWITCH
REMOTE SENSOR JACK
ON
OFF

Figure 1

5. Operation

5.1 Turn the ON/OFF switch to “ON” position.

5.2 Display reads percent oxygen.

5.3 If the alarm sounds the percentage oxygen has dropped below the present alarm lever (factory set to 19.5%). The alarm will turn off automatically when the oxygen concentration rises above the alarm level.

5.4 If the word “BAT” is indicated on the display the battery must be replaced.

5.5 If the reading is abnormally low in an environment which is known to have sufficient oxygen, and the unit cannot be calibrated, the sensor life is complete and the sensor must be replaced.

6. Calibration

NOTE: This instruction assumes that only the internal sensor is in use (external probe disconnected). See option instructions for calibration of external probe.

6.1 Turn the monitor “ON” and place it in an environment containing 20.9% oxygen and 79.1% nitrogen. This can be supplied from a calibration cylinder or can be open air if it is known to be clean.

6.2 Adjust the monitor to read 20.9% by turning the set screw which is located on the right side of the monitor behind a black grommet. Use a small jewels screwdriver to make the adjustment.

7. Sensor Replacement

7.1 Sensors for the Model 55 are provided in a sealed bag to prevent depletion of the electrolyte prior to required use. Sensor depletion begins when the bad seal is broken.

7.2 Remove the four screws from the rear of the monitor and open the case.

7.3 Remove the sensor from the clamp in the back panel and unplug it from the printed circuit board.

7.4 Insert the new sensor into the clamp. The sensor should be oriented as indicated in Figure 2 and the tip of the sensor must rest inside the hole in the center. Plug the connector into the printed circuit board.

7.5 Replace the back cover and install the four screws. Turn the monitor “ON”.

7.6 Allow 1 hour of stabilization.

7.7 In a clean air environment, turn the calibration adjustment to increase the reading to it's maximum value.

a. If the maximum reading exceeds 23% Oxygen, then the monitor circuit if OK. Calibrate to 20.9% and return the monitor to normal use.

b. If the maximum reading is lower than 23%, but higher than 21.5%, the monitor is safe to use, but the sensor life may be less than two years. The monitor may be returned to Sierra Monitor for a NO COST upgrade to insure full sensor life.

c. If the maximum reading is less than 21.5% the monitor is not operating correctly and should be returned to Sierra Monitor for repair.

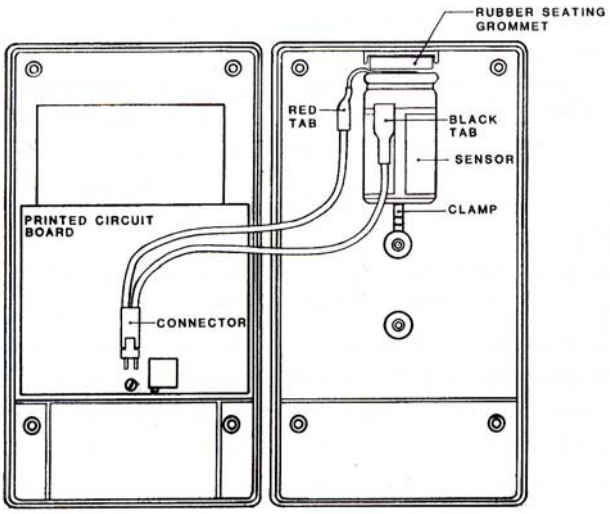

FIGURE 2 Sensor Installation

8. Battery Replacement

8.1 When the “BAT” indicator is displayed approximately 8 hours of battery life remain.

8.2 Slide off the battery cover located on the lower rear of the unit. Remove the battery and disconnect.

8.3 Connect a new battery and carefully install it in the compartment taking care to stow the wires in a way in which they will not be crimped or cut by the cover. Place the cover back onto housing and secure with the four screws.

9. Remote Sensor Option

9.1 Use the remote sensor option to check the confined environment before entry.

9.2 Plug the probe into the top of the monitor and loop the cable securely around the belt clip. When the remote probe is plugged in the internal sensor is disabled and the display reads the remote probe concentration.

9.3 The remote probe will require 5-10 minutes to stabilize depending upon the time since last use.

9.4 Calibrate, if necessary, by following the instructions in Section 6 except that the adjusting screw is located in the back of the remote sensor head.

10. Specifications

SENSOR transducer.	OXYMAX™ oxygen concentration
DISPLAY	3 digit LCD, $\%0_2$ in air from 0% to 25.0% with low battery indicator.
ACCURACY	$\pm$ 3% of full scale from 10 to 50^{o}C
	$\pm$ 4% of full scale from 0 to 50^{o}C
RESPONSE	10 seconds to 90% indication
RESOLUTION	0.1% Oxygen
SENSOR LIFE	21 months in ambient air
PRESSURE SENSITIVITY	0.33% 0_2 change for 300 foot elevation change or 75 mm Hg barometric change.
TEMPERATURE	Operating Range: 0 to 50^{o}C

CONTROLS	ON/OFF switch.
CALIBRATION ADJUSTMENT	Calibrate both internal and external sensors against dry 0_2 /N_2. Both calibration adjustments are with jeweler screwdriver.
ALARAMS	Audible: Factory set to alarm below 19.5% 0_2. Visual: LED lights when Audible Alarm sounds.
CONNECTIONS	Alarm earphone jack. External sensor jack.
BATTERY	9V alkaline. 200 hours life typical.
EARPHONE	Supplied with 36” cable length.
EXTERNAL SENSOR	(Optional) Sensor, housing and circuitry provided with 20 foot cable.
INTRINSIC SAFETY	Designed for intrinsic safety.
SIZE	(HWD) 5.7” x 3.5” x 1.4” (14.5 x 8.9 x 3.6 cm)

WEIGHT	11 Oz. (0.3 Kg)
INTERFERING GASES	Ozone, chlorine and other highly oxidizing gases will interfere to the extent of their oxygen equivalent. Highly corrosive atmosphere will cause premature failure.
CASE	Three-piece, molded of high impact plastic.

11. Limited Warranty

SIERRA MONITOR CORPORATION warrants its products to be free from defects in workmanship or material under normal use and service for two years after date of shipment. SMC will repair or replace without charge any equipment found to be defective during the warranty period. Final determination of the nature and responsibility for defective or damaged equipment will be made by SMC personnel.

All warranties hereunder are contingent upon proper use in the application for which the product was intended and do not cover products which have been modified or repaired without SMC approval or which have been subjected to accident, improper maintenance, installation or application, or on which original identification marks have been removed or altered. This Limited Warranty also will not apply to interconnecting cables or wires, consumables (i.e. calibration gases, batteries, sensors), nor to any damage resulting from battery leakage.

In all cases SMC's responsibility and liability under this warranty shall be limited to the cost of the equipment. The purchaser must obtain shipping instructions for the prepaid return of any item under this warranty provision and compliance with such instruction shall be a condition of this warranty.

Except for the express warranty stated above, SMC disclaims all warranties with regard to the products sold hereunder including all implied warranties of merchantability and fitness and the express warranties stated herein are in lieu of all obligations or liabilities on the part of SMC for damages including, but not limited to, consequential damages arising out of/or in connection with the use or performance of the product.

WARRANTY REGISTRATION SERIAL # _____

Model 55 Oxygen Deficiency Monitor

Name: _____

Company: _____

Address: _____

City/State/Zip: _____

Phone: _____

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☐ Remote Probe for my Model 55 Oxygen Monitor

☐ Spare parts for Model 55

☐ Sentry – Fixed installation monitor for Combustible, Oxygen, and Toxic Gases

☐ Other fixed installations

☐ Please send the Sierra Monitor General Catalog